



4319.68136

## PATENT APPLICATION

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Takae Ito

Serial No.: 10/613,803

Conf. No.: 7339

Filed: 7/3/2003

For: LIQUID CRYSTAL DISPLAY  
DEVICE WITH FLEXIBLE  
PRINTED CIRCUIT BOARD

Art Unit: 2871

Examiner: Vu, Phu

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) Appr. February 20, 1998

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**REASONS FOR PRE-APPEAL REVIEW**

Mail Stop AF  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

The pending claims of the present application stand rejected on a basis of Oishi U.S.P.N. 6,532,055 in combination with Sato U.S.P.N. 6,345,887. Applicant requests review of this rejection because (1) the cited prior art references, taken alone or in combination, fail to disclose or suggest mounting two driver integrated circuits (ICs) on a flexible circuit board, (2) the cited prior art references fail to disclose or suggest input signals being cascade connected between at least two driver ICs on a flexible circuit board, which acts as a source driver, and (3) Sato is not analogous art.

With respect to claim 4, Applicant additionally requests review of the rejection of this claim because the cited prior art references fail to disclose or suggest that the internal

wiring between cascaded driver ICs is provided on the side of the printed circuit board with respect to the driver ICs.

The December 14, 2005 final Office Action rejects claims 1-3 under 35 U.S.C. 103(a) as being obvious over Oishi in view of Sato. Applicant respectfully submits that this rejection applies to claims 1 and 3-5, and feels that a pre-appeal review is appropriate in this case because the Examiner has not identified essential elements required to establish a *prima facie* case of obviousness.

First, as previously argued in Response C filed March 1, 2006, both Oishi and Sato fail to teach a plurality of flexible circuit boards that have two driver ICs mounted thereon, as recited in independent claim 1. In order to establish a *prima facie* case of obviousness, Section 2143.03 of the MPEP requires that even a combination of references under a Section 103 rejection must still first demonstrate each and every feature and limitation of the claimed invention. This requirement has not been satisfied in the present case, however.

On page 3 of the December 14, 2005 final Office Action, the Examiner states "Oishi fails to teach two driver ICs that are mounted on each flexible printed circuit board." In the Advisory Action mailed March 21, 2006, the Examiner asserts that page 2, last paragraph of Oishi teaches flexible printed circuit boards because the driver ICs are mounted to a tape carrier package. (See col. 5, lns. 1-10). The cited portion of Oishi merely discloses flexible cables 5-7 connected to a wiring pattern 200. (See FIGs. 1A-1B). However, as shown in FIGs. 2A and 2B of Oishi, the flexible cables 6 and 7 are connected to pads, and the gate drivers 18 and 21 are not formed on the flexible cables 6 and 7. Instead, the source drivers 8-17 are formed on a source driver substrate 2, and the gate drivers 18-25 are formed

on gate driver substrates 3 and 4. Accordingly, Oishi fails to disclose or suggest mounting driver ICs on a flexible circuit board. Sato also fails to disclose or suggest this feature, contrary to the Examiner's assertions.

In the December 14, 2005 final Office Action, the Examiner asserts that Sato teaches two driver ICs (see FIG. 2, and element 15) that are mounted on a single printed circuit board (element 12). The Examiner has not provided any support for Sato teaching a flexible circuit board. Accordingly, even if the teachings of Sato are combined with Oishi, the combination fails to disclose or suggest a flexible circuit board having driver ICs mounted thereon. Since the Examiner fails to demonstrate the above feature of the claimed invention to establish a *prima facie* case of obviousness, the present §103 rejection is improper and should be withdrawn.

Second, the Examiner fails to demonstrate the element of at least two driver ICs mounted on a flexible circuit board that are cascaded to each other with respect to an input signal by internal wirings and a flexible circuit board, with each driver IC putting a liquid crystal driving signal to drive liquid crystal in the liquid crystal panel. Therefore, no *prima facie* case of obviousness is established.

The Examiner admits that Sato does not teach cascading of driver ICs on page 3, line 8 of the December 14, 2005 final Office Action. Instead, the Examiner asserts that Oishi teaches driver ICs cascaded with respect to input signals 16-18 of FIG. 1B. Elements 16-18 are not shown in FIG. 1B of Oishi, but are illustrated in FIG. 1A as source drivers/gate drivers. The source drivers 8-17 are described in Oishi at col. 5, lines 1-12. Driver control signals are inputted from the signal process substrate 27 through the flexible cable 5 to the source driver substrate 2. However, Oishi fails to disclose or suggest any cascade connection

between the source drivers. Accordingly, even if Sato and Oishi are combined, the combination fails to disclose or suggest the feature of at least two driver ICs mounted on a flexible circuit board that are cascaded to teach other with respect to the input signal and internal wirings in the flexible circuit board, with each driver IC outputting a liquid crystal driving signal to drive liquid crystal to the liquid crystal panel. Therefore, the *prima facie* case of obviousness has not been established by the Examiner.

In contrast, the present invention has main wirings 30, as shown in FIG. 2, extending from a printed circuit board without passing through each of the flexible circuit boards. Thus, the main wirings 30 are not cascaded, but the driving ICs in each flexible circuit board are cascaded with respect to the input signal. More specifically, the present invention has the input signal obtained by branching the main wirings 30 into the branch wirings 32. Advantageously, this arrangement overcomes a problem with the pitch of the flexible circuit board becoming short. This is because one bundle of the branch wirings 32 is used for plural driving ICs and the flexible circuit board by cascading the driving ICs in each flexible circuit board with respect to the input signal. Thus, many branch wirings are not necessary, even if there are many driving ICs. Since the combination of Oishi and Sato fail to disclose or suggest input signals being cascade connected between at least two driver ICs on a flexible circuit board, which acts as a source driver, Applicant respectfully requests withdrawal of the §103 rejection.

Third, for the reasons recited in Amendment B filed September 19, 2005, Applicant respectfully submits that there is no motivation to combine the references because Sato is not analogous art. Sato is directed to an ink jet head for a non-impact printer. Sato fails to disclose a liquid crystal display device, or an arrangement that has a liquid crystal

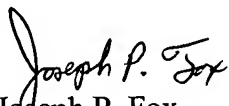
panel and a printed circuit board connected via flexible circuit board and a source driver. The arguments for why Sato is not analogous prior art are discussed more fully on page 6, second paragraph *et seq.* of Amendment B filed September 19, 2005. For the reasons provided therein, Applicant respectfully requests removal of Sato as not analogous prior art. Without Sato, the present §103 rejection must fall.

Finally, with respect to claim 4, Applicant respectfully submits that the rejection is improper because none of the cited references disclose or suggest that the internal wiring is provided on a side of a printed circuit board with respect to the driver ICs. That is, none of the cited references discloses or suggests an internal wiring cascading the input terminals of the plurality of driver ICs is provided inside the flexible circuit board carrying a plurality of driver ICs. Oishi merely discloses having internal wiring to a printed circuit board, but fails to disclose or suggest providing internal wiring to a flexible circuit board, as in the present invention. Since Sato also fails to disclose or suggest this feature, withdrawal of the §103 rejection of claim 4 is respectfully requested for this additional reason.

For these reasons, Applicant respectfully requests allowance.

Respectfully submitted,

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Doc Code: AP.PRE.REQ

PTO/SB/33 (07-05)

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		10/613,803	July 3, 2003
		First Named Inventor	
		Takae Ito	
Art Unit		Examiner	
2871		Vu, Phu	
<p>Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.</p> <p>This request is being filed with a notice of appeal.</p> <p>The review is requested for the reason(s) stated on the attached sheet(s). Note: No more than five (5) pages may be provided.</p>			
<p>I am the</p> <p><input type="checkbox"/> applicant/inventor.</p> <p><input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)</p> <p><input checked="" type="checkbox"/> attorney or agent of record. 41,760 Registration number _____</p> <p><input type="checkbox"/> attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____</p>		<p><u>Joseph P. Fox</u> Signature</p> <p><u>Joseph P. Fox</u> Typed or printed name</p> <p><u>(312) 360-0080</u> Telephone number</p> <p><u>April 14, 2006</u> Date</p>	
<p>NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.</p>			
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